	Work Order October-01-12 3:3	31:05 PM	57		*900	957*							Page	: 1
	Item ID: D Revision ID:	212-664-207	TRN		Accept	*N900	040	100) *	Setup	Start Stop	IVI.	31*	F 15
		1/10/2012	Start Qty: 1.00	*1* *1*		Cust Item Customer:					осор	*N.	;フ*	
				Date: \2-10-0\	_		ate:				Start Stop	*NF	२1* २2*	
Sec.	Sequence ID/ Work Center ID Draw Nbr]	Operation Description		Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	t Reje Qty			Insp.	
. *	D212-664-247		ion Nbr 3 (DEO)											
ý	*100 *100*	-	MORI SEIKI CNC LATI	IE LARGE	0.00				/	(A	K	c 12	-10-5
4 · ·	Mori Seiki Mori Seiki CNC Lathe	Large	2-Turn first s		0.00 8534 on both ends as pe	er Folio FA706			.€	/				-
	*110 *110*	(QC1- Inspect dimensions	to dimension sheet	0.00				/	f	- /	KC	12	10-5
	QC Quality Control		Memo		0.00						<u>~</u> .			-

												DQA:	Dat	e:	
NCR:	Yes	/ No				WORK ORDER NON-C	O	NFORM	AANCE / UP	DATE	Λ	- A Closed:	Dat	٠.	
		···· -	·			DISPOSITION				AGAINST DI					
Work Ord	er:					DISPOSITION				AGAINST DI	_	ARTIVILIATY	PROCESS		
Part f	•					Rework Scrap Use-as-is Work Order Update		f Therm	Skid-tube Machining noforming Large Fab	Crosstube Small Fab Finishing Composite			Water Jet d. Eng. Coor. e/Packaging Supplier		Engineering Quality Other
D = = 4	1	-	r	Г -	Doccri	ption of work order update		nitial		tion		Sign &			
Root Cause	İ	Date	Step	Qty	1	or Non-conformance	ľ	ief Eng		cription		Date	Verificatio	n	QC Inspector
Doc/Data		Date	эсер	- aty		71 Wolf Comornance		iici ziigi	000		\dagger		Vermedie		do mapesto.
Equip/Tooling						•									
Operator	\vdash														
Material	Н	~					İ								
Setup	H		<u>.</u>												
Other											İ				
Process	П														
Supplier	П								-						
Training	П														
Unapproved	П														
						F	AUL	T CATE	GORY						
Landi	ng C	ear				General									7
		Bending				Bend		Grain				Ovalized			Pressure/Forced
		Centre No	ot Conce	ntric to	o/s	BOM/Route		Hardwa	re		_Jc	Over/Under	tolerance		Temperature/Cure
	Cracks			Broken/Damaged		Inspecti	on Incomplete	_	_ P	Part Incorred	ct		Weld		
	Crushed/Crimped				Burrs		Instruct	ions Incomplete	/Unclear	_ P	Part Lost/Mi	ssing	L	Wrong Stock Pulled	
Cuffs				Contamination		Mainte	nance		_ P	Part Moved					
		Heat Trea	it			Countersink		Mislabe	led		P	Positioned V	Vrong		-
		Inspectio	n Strip in	Tube		Cut Too Short		Misread	i		P	Power Loss/	Surge	L	Other
	Inspection Strip in Tube Ripples in Bend				Drill Holes		Offset								

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

Finish Folio October-01-12 3:31:05 PM

140

Quality Control

QC

Item ID: D212-664-207TRN Accept *N900040100* Setup Start **Revision ID:** Crosstube Turning Detail Item Name: **Start Date:** 01/10/2012 Start Qty: 1.00 **Cust Item ID: Required Date:** 16/10/2012 Req'd Qty: 1.00 **Customer:** Reference: Run Process Plan: Date:____ Approvals: **Tooling:** Date: Stop QC: Date: SPC (Y/N): Date: Sequence ID/ Operation Set Up/ Tool ID Tool # Plan Accept Reject Reject Insp. **Work Center ID Description Run Hours** Qty Code Qty Number Stamp 120 0.00 MORI SEIKI CNC LATHE LARGE *120* Mori Seiki 0.00 Memo 2/16/06 Mori Seiki CNC Lathe Large 1-Turn second side as per Folio FA706 2- File transition lines smooth. 3-Remove sand and plugs FOLIO REV: DWG REV: 130 QC1- Inspect dimensions to dimension sheet 0.00 *130* QC 0.00 Memo Quality Control 90/10/06 140 QC8- Inspect parts - second check 0.00

0.00

Memo

•										DQA:	bate:	
NCR:	Yes / No				WORK ORDER NON-C	CONFO	ORM	IANCE / UPD	DATE	QA Closed:	Date:	
Work Orde	er:				DISPOSITION			- Table 1	AGAINST D	DEPARTMENT,		
Part N	No.			-	Rework Scrap Use as-is Work Order Update) 	M hermo	ikid-tube lachining oforming arge Fab	Crosstube Small Fab Finishing Composite		Water Jet d. Eng. Coor. re/Packaging Supplier	Engineering Quality Other
Root	2. **			Descri	ption of work order update	Initi	ial	Acti	on	Sign &	·	
Cause	Date	Step	Qty	(or Non-conformance	Chief	Eng	Descri	ption	Date	Verification	QC Inspector
Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training Unapproved		`	- 7.		•				•			
W	<u> </u>	1		 	F	AULT C	ATEG	ORY			<u> </u>	, L ,
Landi	ng Gear				General							
<i>y</i>	Bending Centre No	ot Concer	ntric to	o/s	Bend BOM/Route	\vdash	rdwar			Ovalized Over/Under	├	Pressure/Forced Temperature/Cure
	Cracks				Broken/Damaged			n Incomplete		Part Incorre	 	Weld
	Crushed/	Crimped.			Burrs	_		ons Incomplete/U	Inclear	Part Lost/M		Wrong Stock Pulled
	Cuffs				Contamination	\vdash	ainter		-	Part Moved		
,	Heat Trea			<u> </u>	Countersink	\vdash	slabele	ed	<u> </u>	Positioned \		7
		•	Tube	· _	Cut Too Short	\vdash	sread		L	Power Loss,	/Surge	Other
	Inspection Strip in Tube , Ripples in Bend				Drill Holes	Off	fset					

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

Finish Folio

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

October-01-12 3:31:05 PM

Quality Control

Item ID: Revision ID:	D212-664-2	07TRN		Accept	*N900	040	100)*	Setup St	art 🛪	VS1*
Item Name:	Crosstube Tu	rning Detail							St	top *	US2*
Start Date:	01/10/2012	Start Qty: 1.00	*1*		Cust Item	ID:				-	
Required Date	: 16/10/2012	Req'd Qty: 1.00	*1*		Customer:						
Reference:											
Approvals:	Process Pla	an:	Date:	Tooling:	D	ate:		F		art *	VR1 *
	QC:	-	Date:	_ SPC (Y/N):	D	ate:			St	top *	VR2*
Sequence ID/ Work Center I	D	Operation Description		Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Numb	
145				0.00				_	•		•
145 Crosstubes				0.00				Kas		Z-10	1-10
Crosstubes		Memo GRIND ON	I V TRANSITION LINES	0.00 S SMOOTH LONGITUDE	WAV			•	•		•
*150				0.00				1		12-10	1 - 18
HandFXtube		Memo		0.00				KN	7 <u> </u>	12-10	7-10
Hand Finishing Cro	osstubes	1- PRESSUI	RE WASH X-TUBE INSI	DE AND OUT							
		2- ACID ET	CH X-TUBE INSIDE AN	ID OUT. USE RED SCOT	CH BRITE						
160 *4 CO*		QC5- Inspect part comple	eteness to step on W/O	0.00			_				
160		Memo		0.00			B	$H \rightarrow$			

												DQA:	Date	e: ຺	
NCR:	Yes	/ No			,	WORK ORDER NON-	100	NFORN	/IANCE / UP	DATE		QA Closed:	Dat	e:	
NA (a ml) O mel			- 			DISPOSITION				AGAINST		PARTMENT/			
Work Ord Part I	٠ . No.					Rework Scrap Use-as-is Work Order Update		Therm	Skid-tube Machining noforming Large Fab	Crosstube Small Fab Finishing Composite			Water Jet d. Eng. Coor. e/Packaging Supplier		Engineering Quality Other
Root					Descri	ption of work order update		Initial	Ac	tion		Sign &			
Cause		Date	Step	Qty	(or Non-conformance	Cr	nief Eng	Desc	ription		Date	Verification	,	QC Inspector
Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training Unapproved	Oata //Tooling // ator // rial // ress // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring // ring										·				
					·		AUI	LT CATE	GORY						
Landi		Bending Centre No Cracks Crushed/ Cuffs Heat Trea	Crimped.		o/s	General Bend BOM/Route Broken/Damaged Burrs Contamination Countersink		Grain Hardware Inspection Incomplete Instructions Incomplete/Unclear Maintenance Mislabeled				Ovalized Over/Under Part Incorred Part Lost/Mi Part Moved Positioned V	ct issing Vrong		Pressure/Forced Temperature/Cure Weld Wrong Stock Pulled
ł	Inspection Strip in Tube			rube		Cut Too Short	1	Misread	ı		L	Power Loss/	ourge		Other

Offset

Out of Calibration

Out of Sequence

Outside Dimensions

Ripples in Bend

Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drill Holes

Drawing

Finish

Page 4

October-01-12 3:31:05 PM Item ID: D212-664-207TRN Accept *N900040100* Setup Start **Revision ID:** Item Name: Crosstube Turning Detail **Start Date:** 01/10/2012 Start Qty: 1.00 **Cust Item ID:** Req'd Qty: 1.00 **Required Date:** 16/10/2012 **Customer:** Reference: Run Process Plan: ____ Date:___ **Approvals: Tooling:** Date: QC: _____ Date: ____ SPC (Y/N): Date: Operation Sequence ID/ Set Up/ Tool ID Tool # Plan Reject Reject Accept Insp. Work Center ID Description **Run Hours** Qty Code **Qty** Number Stamp 170 0.00 Packaging *170* 12-10-15 Packaging 0.00 Memo Packaging Identify and stock in kanban rack Location: \angle 10/1170) CMF 12-10-16 180 QC21- Final Inspection - Work Order Release 0.00 *120* QC 0.00 Memo Quality Control

											DQA:	Date:	
NCR:	Yes	/ No				WORK ORDER NON	-COI	NFORN	MANCE / UPDAT		QA Closed:	Date:	*
Mark Ord	Ar:					DISPOSITION			,	AGAINST DEI	PARTMENT	/PROCESS	
Work Ord Part I NCR I	- _ No.					Rework Scrap Use-as-is Work Order Update		N Therm	Machining S noforming I	rosstube mall Fab Finishing mposite		Water Jet d. Eng. Coor. re/Packaging Supplier	Engineering Quality Other
Root					Descri	ption of work order update		Initial	Action		Sign &		
Cause		Date	Step	Qty	, c	or Non-conformance	Cł	nief Eng	Descriptio	on	Date	Verification	QC Inspector
Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training Unapproved													
					1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	·	FAU	LT CATE	GORY				
Landi		Bending Centre No Cracks Crushed/ Cuffs Heat Trea Inspectio	Crimped at n Strip in		o/s	General Bend BOM/Route Broken/Damaged Burrs Contamination Countersink Cut Too Short		Instruct Mainte Mislabe Misreac	re on Incomplete ions Incomplete/Uncle nance led		Ovalized Over/Under Part Incorre Part Lost/M Part Moved Positioned N Power Loss/	ct issing Wrong	Pressure/Forced Temperature/Cure Weld Wrong Stock Pulled Other
	Ripples in Bend					Drill Holes	ı	Offset					

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

Finish Folio

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Picklist Print

October-01-12 3:31:09 PM

Work Order ID: 90957

90957

Parent Item:

D212-664-207TRN

Parent Item Name: Crosstube Turning Detail

D212-664-207TRN

Start Date: 01/10/2012

Required Date: 16/10/2012

Page 1

Start Qty: 1.00

Required Qty: 1.00

Comments:

IPP Rev:A New Issue 08-03-06 DD verified by:ec IPP Rev B 08.04.02 Removed polish EC verified DD

Component Item ID/	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6008-132		Manufactured	No			110	Each	0.0000	1	 1			
D6008-13	32								**	_			

Crosstube extrusion

B59249

12-10-04

6008-180

					•							DQA:	Date	: <u></u> _				
NCR; Y	'es	/ No		••	*		WORK ORDER NON-C	O	NFORM	ANCE / UPE	DATE							
•	•			***								QA Closed:	Date	:				
Nork Orde	r.			• .•			DISPOSITION				AGAINST DE	PARTMENT/	PROCESS					
· ·	٠						Rework	1		Skid-tube	Crosstube		Water Jet	Engineering				
Part N	lo.				•	١.	· Scrap		ſ	Machining	Small Fab	Proc	I. Eng. Coor.	Quality				
						١	Use-as-is			noforming	Finishing	Rec/Stor	e/Packaging	Other				
NCR N	lo.					١	Work Order Update]		Large Fab	Composite		Supplier					
			ľ			<u> </u>		\vdash	:A:I	, Act	1	Cian 0						
Root		Date	.C+on	Qty	Desc		tion of work order update r Non-conformance	1	nitial ief Eng	Descr		Sign & Date	Verification	QC Inspector				
Cause oc/Data	-	Date	Step	Qty			i Non-comormance		iei Liig	Desci	iption	Date	Verification	QC IIISPECTOI				
quip/Tooling																		
perator	T]						
1aterial																		
etup				. •														
ther								,	· ·									
rocess									:	. (
upplier					•													
raining								1					÷					
napproved																		
							F	AUL	T CATE	GORY								
Landi	_	ı			۲-		General		1			7	Г-	¬				
		Bending			.	_	Bend	<u> </u>	Grain			Ovalized	_	⊣ :				
		Centre No	ot Concer	ntric to (O/S		BOM/Route	_	Hardwa		_	4		-				
		Cracks			<u></u>		Broken/Damaged	<u></u>	1	on Incomplete	.	Part Incorred	-	 ∤				
	Crushed/Crimped.			_	Burrs	_	1	ions Incomplete/L	Jnclear	Part Lost/Mi	ssing _	Wrong Stock Pulled						
	Cuffs			_	Contamination	-	Mainte		<u> </u>	Part Moved								
	Heat Treat				Countersink	-	Mislabe		<u> </u>	-∤		704						
	Inspection Strip in Tube				Cut Too Short	-	Misread	i	L	Power Loss/	Surge	Other						
	Ripples in Bend				_	Drill Holes Drawing	-	Offset	Calibratio=									
	Torque Waves in Extrusion Turning Sequence					Finish	-	4	Calibration Sequence									
		_	-		}		Folio :	\vdash	•	Dimensions								
	Wave/Twist in Tube					י טווט ,	ı	1-0 a tside	בווטוטווז ווייום אווייים ו			nder tolerance Temperature/Cure orrect Weld t/Missing Wrong Stock Pulled						

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

DART AEROSPACE LTD	Work Order:	90957
Description: Crosstube Assembly (205/212 Low Aft)	Part Number:	D212-664-247
Inspection Dwg: D212-664-247 Rev: B		Page 1 of 2

FIRST ARTICLE INSPECTION CHECKLIST

	nspection Sheet awing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
	0.438	+/-0.010	,438			vern	0 6 00/
	2.680	+0.005/-0.000	2.680			Con	CNC-04
	2.680	+0.005/-0.000	2.683	-/-			
	2.687	+0.005/-0.000	2.689	/			
	2.802	+0.005/-0.000	2.804	7			
_	2.906	+0.005/-0.000	2.908	//			
ΕA	3.009	+0.005/-0.000	3.012				
SIDE	3.112	+0.005/-0.000	3.114				
•,	3.250	+0.005/-0.000	2.250			<i>y</i>	
	0.438	+/-0.010	.438			vern	o who
	2.680	+0.005/-0.000	2-680			1	C 00 (2-09
٠	2.680	+0.005/-0.000	2-682				
	2.687	+0.005/-0.000	2688				
	2.802	+0.005/-0.000	2.865				
m	2.906	+0.005/-0.000	2.908			7	
	3.009	+0.005/-0.000	3.094				
SIDE	3.112	+0.005/-0.000	3.1140				
	3.250	+0.005/-0.000	3.250			V	
	d.						
							,
-							
	128.268	+/-0.030	128.26			tope	1622

									DQA:	Date:	-
NCR: Ye	es / No				WORK ORDER NON-C	ONFOR	MANCE / UPI		QA Closed:	Date:	<i>;</i>
Work Order					DISPOSITION			AGAINST DE	PARTMENT	/PROCESS	
Part No).				Rework Scrap Use-as-is Work Order Update	ł I	Skid-tube Machining noforming Large Fab	Crosstube Small Fab Finishing Composite		Water Jet d. Eng. Coor. re/Packaging Supplier	Engineering Quality Other
Root				Descri	ption of work order update	Initial	Act	ion	Sign &		
Cause	Date	Step	Qty	,	or Non-conformance	Chief Eng	Desci	ription	Date	Verification	QC Inspector
Doc/Data Equip/Tooling Operator Material Setup Other								11. j		,	
Process Supplier								•		,	-

Landin	ng Gear	General	
[Bending	Bend	Grain Ovalized Pressure/Forced
	Centre Not Concentric to O/S	BOM/Route	Hardware Over/Under tolerance Temperature/Cure
	Cracks	Broken/Damaged	Inspection Incomplete Part Incorrect Weld
. [Crushed/Crimped.	Burrs	Instructions Incomplete/Unclear Part Lost/Missing Wrong Stock Pulled
	Cuffs	Contamination	Maintenance Part Moved
	Heat Treat	Countersink	Mislabeled Positioned Wrong
Ī	Inspection Strip in Tube	Cut Too Short	Misread Power Loss/Surge Other
[Ripples in Bend	Drill Holes	Offset ,*
Ī	Torque Waves in Extrusion	Drawing	Out of Calibration
	Turning Sequence	Finish	Out of Sequence
	Wave/Twist in Tube	Folio	Outside Dimensions

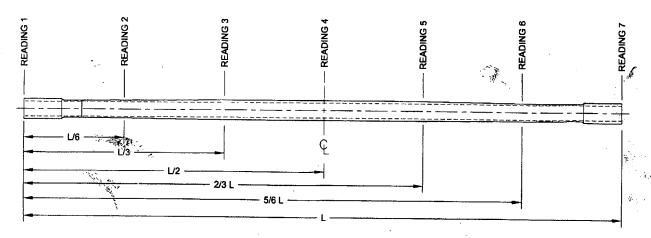
FAULT CATEGORY

Training Unapproved

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

DART AEROSPACE LTD	Work Order:	90957
Description: Crosstube Assembly (205/212 Low Aft)	Part Number:	D212-664-247
Inspection Dwg: D212-664-247 Rev: B		Page 2 of 2

WALL THICKNESS MEASUREMENT



	WALL	THICKNESS	MEASUREMEN	NT (IN)	Deviation	
Location	w1	w2	w3	w4	Δw (max-min)	TOLERANCE
READING 1 L= 0"	-165	.153	-148	.160	,017	
READING 2	-152	.161	-167	-155	.015	
READING 3	. 285	.301	. 294	297	.024	
READING 4.	1142	.437	.437	.443	-006	0.054"
READING 5	. 303	.293	272.	282	-031	*
READING 6	. 103	.160	-155	-156	800,	
READING 7	. 165	148	.156.	.160	-012	

Calibration Result

Actual Block Thickness: 100 500

Meas	ured by:	April,	Audited by: TW	Preliminary Approval:	
	Date:	12/10/06	Date: 12-10-9	Date:	
Rev	Date	Change		Revised by	Approved
Α	08.11.07	New Issue	(P/O D212-664-207)	KJ/EC	110000

A 08.11.07 New Issue (P/O D212-664-207) B 10.04.01 Dwg Rev updated	KJ/EC	Approved
		
		1
C 10.08.03 Dimension 128.268 was 128.27	KJ 10	+ 11
D 12.06.04 Wall thickness form added	KJ OS	+ **

												DQA:	Dat	e: _	
NCR:	Yes	/ No				WORK ORDER NON-O	CON	NFOR	MANCE / UP	DATE		_			
												QA Closed:	Dat	:e:	
Work Ord	or.					DISPOSITION			•	AGAINST	DE	PARTMENT/	PROCESS		
						Rework			Skid-tube	Crosstube	_	Dwo	Water Jet		Engineering
Part I	No.					Scrap Use-as-is	1 1		Machining noforming	Small Fab Finishing			d. Eng. Coor. e/Packaging		Quality Other
NCR 1	No.					Work Order Update		mem	Large Fab	Composite	$\overline{}$	Nec/stor	Supplier		
Root					Descri	ption of work order update		nitial	Ac	ction		Sign &			
Cause		Date	Step	Qty	(or Non-conformance	Ch	ief Eng	Desc	cription		Date	Verification	1	QC Inspector
Doc/Data															
Equip/Tooling	Ш														
Operator															
Material	_														
Setup															
Other	Щ		ł												
Process			1									·			
Supplier	Ш														
Training	H														
Unapproved	<u> </u>		<u> </u>	<u> </u>	<u> </u>		<u> </u>	T CATE	GORY						·
Landi		2025				General	AUL	.I CAIL	GONT						
Laliu	L E	Bending				Bend	Г	Grain			Г	Ovalized			Pressure/Forced
	-	Centre N	ot Conce	ntric to	o/s \vdash	BOM/Route	\vdash	Hardwa	are		\vdash	Over/Under	tolerance	_	Temperature/Cure
		Cracks			-/-	Broken/Damaged		-1	ion Incomplete			Part Incorred			Weld

Instructions Incomplete/Unclear

Maintenance

Out of Calibration

Out of Sequence

Outside Dimensions

Mislabeled

Misread

Offset

Part Lost/Missing

Positioned Wrong

Power Loss/Surge

Part Moved

Wrong Stock Pulled

Other

Ripples in Bend

Turning Sequence

Wave/Twist in Tube

Crushed/Crimped.

Inspection Strip in Tube

Torque Waves in Extrusion

Cuffs

Heat Treat

Burrs

Contamination

Countersink

Cut Too Short

Drill Holes

Drawing Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G

Item	Qty -247	Qty -247B	Part Number	Description
1	х		D212-664-247	CROSSTUBE ASSEMBLY (205/212 LOW AFT)
2		X	D212-664-247B	CROSSTUBE ASSEMBLY (214 LOW AFT)
3	1	1	D6008-132	CROSSTUBE
4	2	2	D2940-1	SUPPORT
5	4	4	D3595-063-530	RUBBER CUSHION
6	2	2	D3660-1	CUFF
7	4	-4	MS21920-28	CLAMP (OR MS21920-30)
8	44	44	CR3212-4-06	RIVET (OR M7885/3-4-06)
9	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
10	A/R	A/R	SIKAFLEX-241/-291	SEALANT (OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT)

GENERAL NOTES:

8

D

- 1) MATERIAL: MANUFACTURED FROM D6008-132 FINISHED LENGTH = 128.268±0.020 (BEFORE BENDING/TRIMMING)
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1 PRIME INSIDE AND OUTSIDE PER DART OSI 005 4.2
 PAINT OUTSIDE PER DART OSI 005 4.2
 TOLERANCES ARE PER DART OSI 018 UNLESS OTHERWISE NOTED.
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHAPE FORES: 0.005 TO 0.010 MAX.
 IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- WEIGHT: D212-664-247 = 36.6 lbs (PER IIN-D212-664) D212-664-247B = 36.6 lbs (PER IIN-D212-664)
- PART IS SYMMETRIC ABOUT CENTERLINE.
- WHEN MACHINING TAPER, RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALY, TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D., EXCEPT UP TO 10% IS ALLOWED IN AREA NOTED.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.

 12) INSTALL D2940-1 SUPPORTUSING 0.03* TO 0.06* THICK LAYER OF MACNOBOND 6398 TO THE SURFACE OF D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALL ATOM AND DECRETOR DEVELOPMENT. INSTALLATION AND PRIOR TO PACKAGING.
- INSTALLATION AND PRIOR TO PACKAGING.

 13) INSTALL MS21920-26 CLAMPS (OR. 30) WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE D2940-1

 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.

 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE
- SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS.
 DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS
- NOT BOTTOMED-OUT AFTER TORQUING.

 NOT BOTTOMED-OUT AFTER TORQUING.

 INSTALL D3860-1 CUFF AFTER CHEMICAL CONVERSION COAT BUT BEFORE PAINT, WITH A LAYER OF SIKAFLEX-241/-291 OR PROSEAL 890 OR MIL S-8802 CLASS 82 SEALANT BETWEEN CUFF AND CROSSTUBE. SEAL EDGE OF CUFF TO ENSURE NO GAPS.
- 17) TOUCH-UP HOLES WITH CHEMICAL CONVERSION COAT.

SHOWERY MID WNTO * ** #FEFRING THE WIRE MALED COPY BUCCOUN AMENDMENT WATER HALL NOTICE 90957 MLT 12-10-01

000# 11-614 11.07.28 UNDER REVIEW

В			OTES/PART LIST; UPDATE TO RDS; ADD -247B (ZN C4-2, D5-2)	RF	09.09.30			
Α	NEW IS	SSUE		CP	07.07.07			
REV.			BY	DATE				
DESIGN		q?	DART AEROSP	ACE	LTD			
DRAWN		RF	HAWKESBURY, ONTAR					
CHECKE	Ð	P	DRAWING NO.	REV. B				
MFG. AF	PR.	77	D212-664-247	,	SHEET 1 OF 4			
APPRO\	/ED	10	TITLE		SCALE			
DE APPI	₹.	#	CROSSTUBE (205/212 LOW AFT) NTS					
DATE	09.0	9.30	COPYRIGHT © 2007 BY DART / THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLY HOT TO BE USED FOR ANY PURPOSE OR COREED OR COMMUNICATION OF THE PERSON AND THE REPORT AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON AND THE PERSON A	ED ON THE EXPRE	SS CONDITION THAT IT IS			

6

											DQA	Date	e:
NCR: \	⁄es	/ No				WORK ORDER NON-O	CON	IFORN	ANCE / UP	DATE			
		•					_				QA Closed	: Date	e:
Work Orde	or.					DISPOSITION				AGAINST DE	EPARTMENT	/PROCESS	
WORK OTAL	٠,,					Rework	1		Skid-tube	Crosstube	7	Water Jet	Engineering
Part N	۷o.					Scrap]	r	Machining	Small Fab	Pro	od. Eng. Coor.	Quality
			,			Use-as-is] [noforming	Finishing	Rec/Sto	re/Packaging	Other
NCR I	No.					Work Order Update	ا		Large Fab	Composite	J	Supplier	
Root					Descri	ption of work order update	lı	nitial	Ac	tion	Sign &		
Cause		Date	Step	Qty	(or Non-conformance	Chi	ief Eng	Desc	ription	Date	Verification	QC Inspector
Doc/Data													
Equip/Tooling	Ш					•							
Operator	Ш												
Material		•											
Setup	Ш												
Other	Ш												
Process													
Supplier													
Training													
Unapproved			<u>. </u>										
						F	AUL	T CATE	GORY				
Landi	ng (Gear			_	General		•		-	_	-	
	$\overline{}$	Bending				Bend	\vdash	Grain		<u> </u>	Ovalized		Pressure/Forced
		Centre No	ot Concer	ntric to	o/s	BOM/Route		Hardwa	re	<u>_</u>	Over/Unde	r tolerance	Temperature/Cure
		Cracks				Broken/Damaged		Inspecti	on Incomplete	L	Part Incorr	ect	Weld
	\vdash	Crushed/	Crimped.			Burrs	-	1	ions Incomplete/	'Unclear	Part Lost/N	- L	Wrong Stock Pulled
		Cuffs				Contamination		Mainte	nance		Part Move	d	
		Heat Trea	it			Countersink		Mislabe	led		Positioned	Wrong	
		Inspection	n Strip in	Tube		Cut Too Short		Misread	i		Power Loss	s/Surge	Other
		Ripples in	Bend			Drill Holes		Offset	•				

Out of Sequence

Outside Dimensions

Turning Sequence

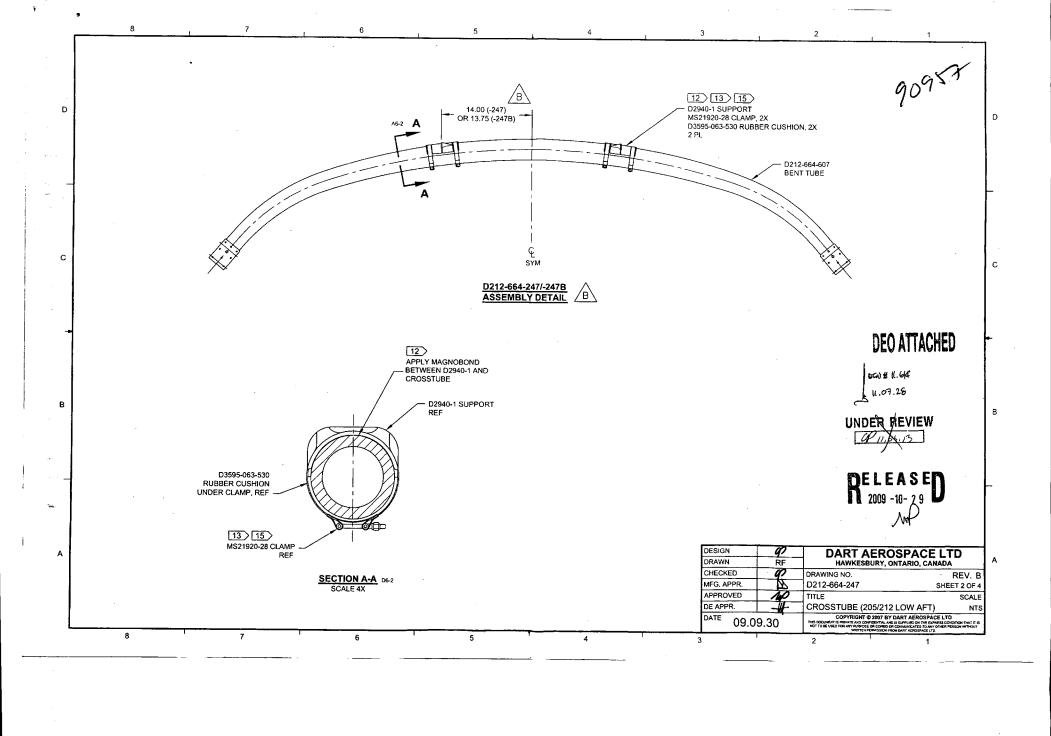
Wave/Twist in Tube

Torque Waves in Extrusion

Drawing

Finish

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G



									DQA:	Date:	
NCR: Y	es / No				WORK ORDER NON-O	CONFOR	MANCE / UPI				
									QA Closed:	Date:	· · · · · ·
Work Orde	·r·				DISPOSITION			AGAINST DE	PARTMENT	/PROCESS	
WOIR Olde					Rework	1 	Skid-tube	Crosstube		Water Jet	Engineering
Part N	lo.				Scrap	1	Machining	Small Fab	Pro	d. Eng. Coor.	Quality
					Use-as-is	-i 1	moforming	Finishing	Rec/Sto	re/Packaging	Other
NCR N	lo				Work Order Update]	Large Fab	Composite		Supplier	
			T								r
Root					ption of work order update	Initial		tion	Sign &		061
Cause	Date	Step	Qty		or Non-conformance	Chief Eng	Descr	ription	Date	Verification	QC Inspector
Doc/Data											
Equip/Tooling	_										
Operator											
Material	_										
Setup											
Other	_										
Process											į
Supplier	_										
Training											
Unapproved			<u> </u>							ļ	
	· · · · · · · · · · · · · · · · · · ·					AULT CATI	GORY				
Landi	ng Gear			,	General			_	7	 	٦
	Bending			ļ	Bend	Grain		L	Ovalized		Pressure/Forced
	Centre	Not Conce	ntric to	o/s	BOM/Route	Hardw	are		Over/Under	tolerance	Temperature/Cure
	Cracks				Broken/Damaged	Inspec	tion Incomplete		Part Incorre	ct	Weld
	Crushed	d/Crimped	-		Burrs	Instruc	tions Incomplete/	Unclear	Part Lost/M	issing	Wrong Stock Pulled
	Cuffs				Contamination	Maint	enance		Part Moved		•
	Heat Tr	eat			Countersink	Mislab	eled		Positioned \	Wrong	_
	Inspect	on Strip ir	Tube		Cut Too Short	Misrea	ıd .		Power Loss,	/Surge	Other

Offset

Out of Calibration

Out of Sequence

Outside Dimensions

Turning Sequence

Wave/Twist in Tube

Ripples in Bend

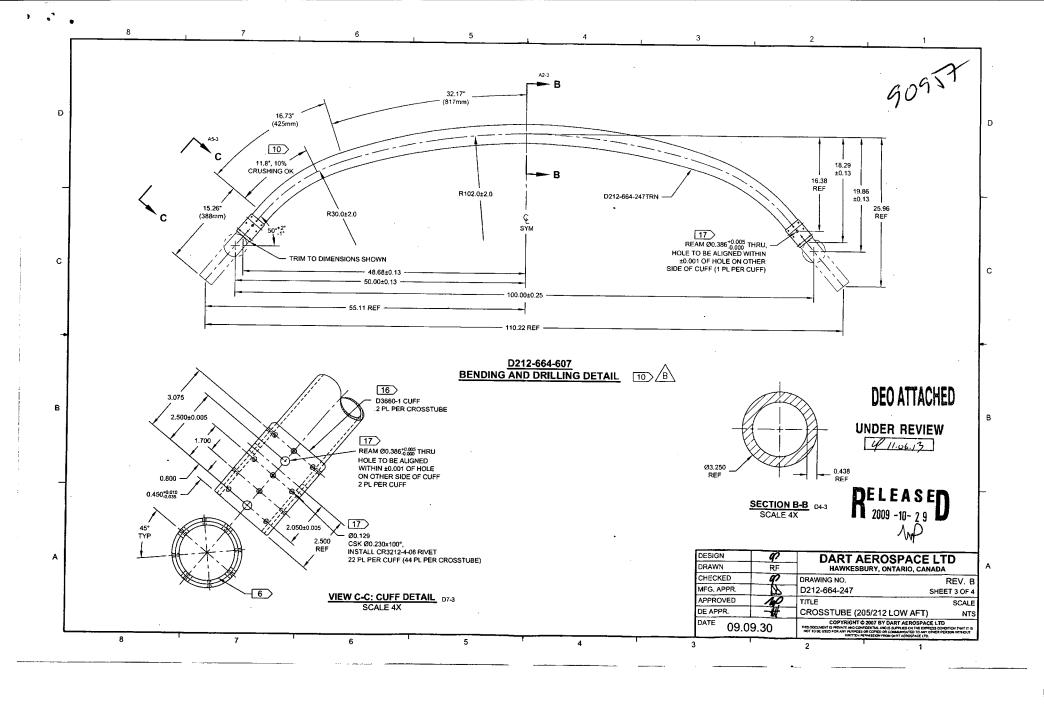
Torque Waves in Extrusion

Drill Holes

Drawing

Finish

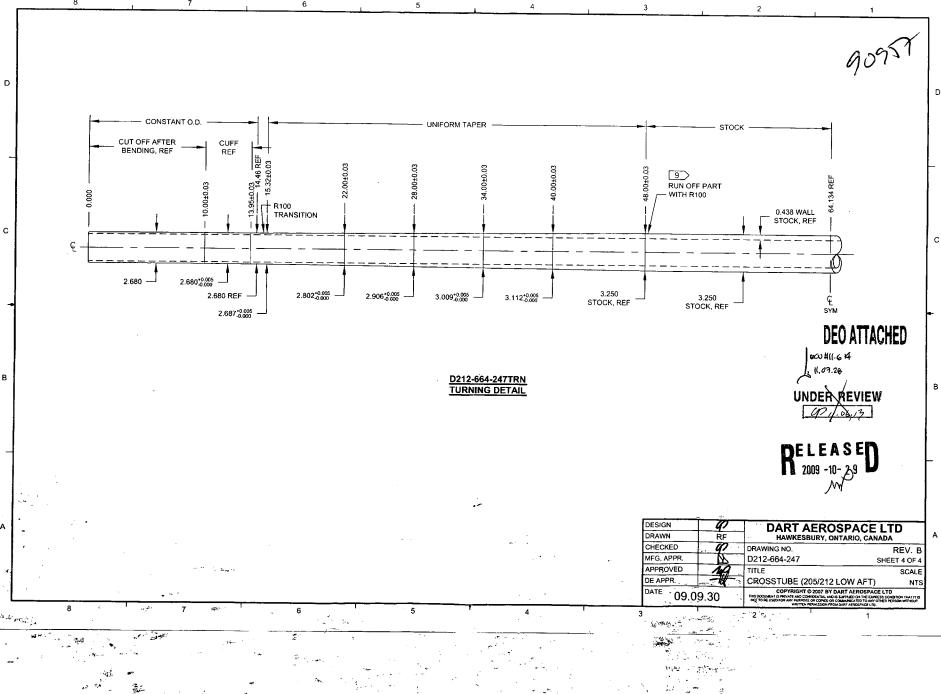
H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G



				DQA:	Date:
NCR:	Yes	/ No	WORK ORDER NON-CONFORMANCE / UPDATE		

	·			·				QA Closed:	Date	:	
Work Orde	or.	·			DISPOSITION		AGAINST [DEPARTMENT,	/PROCESS		
Part N					Rework Scrap Use-as-is	Thor	Skid-tube Crosstube Machining Small Fab moforming Finishing	Pro-	Engineering Quality Other		
NCR N	No		•		Work Order Update] The	Thermoforming Finishing Rec/Store/Packaging O Large Fab Composite Supplier				
Root	-			Descr	iption of work order update	Initial	Action	Sign &			
Cause	Date	Step	Qty		or Non-conformance	Chief Eng	Description	Date	Verification	QC Inspector	
Doc/Data Equip/Tóoling Operator Material											
Setup Other Process								·			
Supplier Training Unapproved		- 04									
опаррточеа	L		<u> </u>	<u>.</u>	F	AULT CAT	EGORY				
Landi	ng Gear				General						
	Bending Centre Cracks Crushe Cuffs Heat Tr Inspect Ripples Torque	Not Conce	ı Tube Extrusio		Bend BOM/Route Broken/Damaged Burrs Contamination Countersink Cut Too Short Drill Holes Drawing Finish	Instruction Maintender Mislatender Misrea Offset Out of	vare ction Incomplete ctions Incomplete/Unclear tenance peled ad	Ovalized Over/Under Part Incorre Part Lost/M Part Moved Positioned V Power Loss/	ct issing Wrong	Pressure/Forced Temperature/Cure Weld Wrong Stock Pulled Other	
	Wave/	wist in Tu	be		Folio	Outsid	de Dimensions			•	

H:/FORMS/Quality Assurance\approved QA/NCRWO Rev G



DQA: Date: **WORK ORDER NON-CONFORMANCE / UPDATE** NCR: Yes / No QA Closed: Date: **AGAINST DEPARTMENT/PROCESS** DISPOSITION Work Order: ____ Skid-tube Water Jet Engineering Crosstube Rework Part No. Quality Scrap Machining Small Fab Prod. Eng. Coor. Thermoforming Rec/Store/Packaging Other Finishing Use-as-is Composite Supplier Work Order Update Large Fab NCR No. Description of work order update Initial Action Sign & Root Chief Eng Description Date Verification QC Inspector or Non-conformance Date Step Qty Cause Doc/Data Equip/Tooling Operator Material Setup Other Process Supplier Training Unapproved **FAULT CATEGORY**

Landing Gear General Grain Pressure/Forced Ovalized Bending Bend Temperature/Cure BOM/Route Over/Under tolerance Centre Not Concentric to O/S Hardware Broken/Damaged Weld Inspection Incomplete Part Incorrect Cracks Crushed/Crimped. Instructions Incomplete/Unclear Wrong Stock Pulled Burrs Part Lost/Missing Cuffs Maintenance Part Moved Contamination Mislabeled Positioned Wrong Heat Treat Countersink Inspection Strip in Tube Cut Too Short Misread Power Loss/Surge Other **Drill Holes** Offset Ripples in Bend Torque Waves in Extrusion Drawing **Out of Calibration** Out of Sequence Turning Sequence Finish Folio Wave/Twist in Tube **Outside Dimensions**

90957

DRAWING NO.	TITLE		סבע ס	DADT AFROME :-				V	L .
		~ ACON (00	REV. B	DART AEROSPACE LT			SHEET	NO.	SCALE
	CROSSTUBI	= ASS Y (208	LOW AFT)	ENGINEERING ORDER	R D212-664	-247-B-1	SHEET 1	OF 1	NTS
DRAWN (0	CHECKED	4>5	MFG. APPR.	APPROVED	SWD	DE APPR.	R/	
DATE 11.0	7.15	DATE //. d	777-7	DATE 11.07.21			 	*!	
			1.20	DATE 11.07.21	DATE ;	1/07/2)	DATE //.	07.21	

PURPOSE:

REPLACE MAGNOBOND WITH PROSEAL.

CHANGE:

IS:

Item	Qty -247	Qty -247B	Part Number	Description
9	A/R	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

WAS:

9	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100.
				TYPE II, CLASS 2 ADHESIVE)

NOTE 12 & 15, SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 12) TO INSTALL D2940-1 SUPPORT: ABRADE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04° TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.

WAS:

- 12) INSTALL D2940-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.



COPYRIGHT © 2011 BY DART AEROSPACE LTD INT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION TH

OR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY WRITTEN PERMISSION FROM DART APPRISACE LTD

		DQA:	Date:	
ICR· Yes / No	WORK ORDER NON-CONFORMANCE / UPDATE			

									QA Closed:	Date	:	
Mork Order: DISPOSITION					DISPOSITION		AGAINST DEPARTMENT/PROCESS					
Part No. NCR No.					Rework Scrap Use-as-is Work Order Update		Skid-tube Crosstube Machining Small Fab Thermoforming Finishing Large Fab Composite			Water Jet d. Eng. Coor. re/Packaging Supplier	Engineering Quality Other	
Root		[Descri	ption of work order update	Initial	Ac	tion	Sign &			
Cause	Date	Step	Qty	1	or Non-conformance	Chief Eng	Desc	ription	Date	Verification	QC Inspector	
Doc/Data								•				
Equip/Tooling												
Operator	7											
Material												
Setup								٠				
Other								T.				
Process												
Supplier							<u> </u>					
Training										!		
Unapproved												
						AULT CATE	GORY					
Landing Gear General Bending Bend Grain Ovalized Pressure/Forced									_			
		Bend Bend Centre Not Concentric to O/S BOM/Route			⊣	⊢ ⊣	Grain				Pressure/Forced	
					}	Hardware			tolerance	Temperature/Cure		
	Cracks		⊢			nspection Incomplete		Part Incorrect		Weld		
		Crushed/Crimped.			Burrs		Instructions Incomplete/Unclear		Part Lost/Missing		Wrong Stock Pulled	
	_	Cuffs			Contamination	\vdash	Maintenance		Part Moved			
	 i	Heat Treat Countersink Inspection Strip in Tube Cut Too Short			\vdash	Mislabeled			Positioned Wrong			
					\vdash	Misread			Power Loss/Surge Other			
	Ripples in			L	Drill Holes	Offset					,	
		Vaves in I		n	Drawing	 	Calibration				· · · · · · · · · · · · · · · · · · ·	
		Turning Sequence Finish				\vdash	Out of Sequence					
	Wave/Twist in Tube Fo				Folio	Outside	e Dimensions					